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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,254	02/07/2001	Leonard Joseph Cimini JR.	2000-0192	6370

7590 01/14/2005

Samuel H. Dworetsky
Room 2A-207
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EXAMINER

PEZZLO, JOHN

ART UNIT	PAPER NUMBER
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2662

DATE MAILED: 01/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/778,254

Applicant(s)

CIMINI ET AL.

Examiner

John Pezzlo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,11-13,15 and 17 is/are rejected.
- 7) ☒ Claim(s) 3,6-10,14,16,18 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

I. Claims 1, 2, 4, 5, 11-13, 15 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Muller et al. "A Novel Peak Power Reduction Scheme For OFDM" hereinafter Muller.

1. Regarding claims 1 and 11 – Muller discloses a method of embedding PAP-reducing inversion sequences onto transmitted data (transmitting optimized transmit sequences, see section 4.1),

Muller discloses determining an initial PAP value for a block of symbols (introduce complex rotation factors with $b_{\mu}=1$, for example see section 4.1),

Muller discloses partitioning the block of symbols into a predetermined number of clusters (partitioned into V pairwise disjoint blocks. Since partitioning of the block is one prior to computation, V is understood to be determined prior to the PAP reduction computation, section 4.1),

Muller discloses selecting a respective phase factor for each of the clusters so as to form an inversion sequence (optimized transmit sequence) that reduces a PAP of transmitted data corresponding to the block of symbols (the number set $\{\pm 1, \pm j\}$ are used as phase factors to form the inversion sequence of each sub-block that has the optimized values, see section 4.1 and 4.3),

Muller discloses embedding the inversion sequence onto the transmitted data by rotating selected tones in each of the clusters based upon a value of the associated phase factor (Rotation of all subcarriers in sub-blocks $v=(1 \dots V)$ to find the optimum transmit sequence. The sequence is then embedded and transmitted as shown in figure 1, see elements "b _{μ} (v)" and "peak value optimization" and section 4.1).

2. Regarding claim 2 - Muller discloses rotating at least one tone in a first one of the plurality of clusters when the corresponding phase factor rotates the first one of the plurality of clusters (all subcarriers in sub-blocks $v=(1 \dots V)$ are rotated, see section 4.1).
3. Regarding claims 4 and 15 - Muller discloses where the phase factors are binary (Muller's embodiment does use the values $\{\pm 1\}$, section 4.3).
4. Regarding claims 5 and 17 - Muller discloses detecting the inversion sequence (the set consisting of all optimum rotation factors has to be transmitted to the receiver so that the subcarriers can be rotated back appropriately, see section 4.2).

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5. Regarding claim 12 - Muller discloses employing an iterative process to determine the phase factors (the process goes through a plurality of phase factor values and determines the optimal value from said plurality of values. It must go through an iterative sequence to determine that optimal value, see section 4.1).

6. Regarding claim 13 - Muller discloses approximating an optimal inversion sequence (perform a peak value optimization for the transmit signal to result in an optimum transmit sequence, see section 4.1).

Allowable Subject Matter

Claims 3, 6-10, 14, 16, 18, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 3 September 2004 have been fully considered but they are not persuasive. Applicants argue on pages 3 and 4 that Muller fails to teach embedding the inversion sequence onto the transmitted data. The examiner respectfully disagrees.

Both the invention and the reference are directed to reducing the peak to average power fluctuations, which occur in an OFDM system. Both the invention and the reference utilize the

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same block diagram as shown in Figure 4 of the invention and Figure 1 of the reference. Both the invention and the reference are directed to determining the values of the vector $b=(b_1 \dots b_m)$ in Figure 4 of the invention and $b=(b_\mu \dots b_\mu)$ in Figure 1 of the reference. Hereinafter the vector b . Both the invention and the reference disclose an iterative process for determining the vector b , which will reduce the peak to average power fluctuations. Both the invention and the reference disclose that no side information needs to be transmitted from the transmitter to the receiver, refer to section 4.2 in Muller.

The applicants argue that Muller does not embed the inversion sequence in the transmitted data. However, the inversion sequence is the vector b . The vector b as shown in Figure 4 of the invention and Figure 1 of the reference is used to multiply the signal sequence (data sequence) and the result is transmitted to the receiver. The invention and the reference disclose that the elements of vector b can be either +1 (plus one) or -1 (minus one). Therefore, the result of the multiplication for each of the parallel branches is either, leave the sign of the signal sequence unchanged or negate the sign of the signal sequence. The inversion sequence (vector b) is embedded in the transmitted data since the sign modifications are an indication of the vector b , which caused the resultant sequence.

The examiner would like to add that the invention and the reference depart in how the receiver determines the vector b not in how the transmitter embeds the inversion sequence (vector b) into the transmitted result. The receiver in the invention given knowledge a priori utilizes this information to determine the vector b after demodulation in order to recover the data sequence.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1. Laroia et al. (US 6,301,268 B1) discloses a communication method for FDM signaling systems with reduces average power requirements.
2. Bauml et al. (US 6,125,103) discloses a method and device for reducing the crest factor in digital transmission procedures.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Pezzlo whose telephone number is (571) 272-3090. The examiner can normally be reached on Monday to Friday from 8:30 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou, can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C.

or faxed to:

(703) 872-9306

For informal or draft communications, please label "PROPOSED" or "DRAFT"

Hand delivered responses should be brought to:

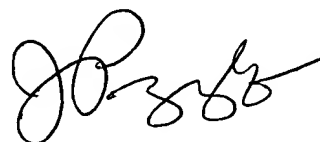
Jefferson Building

500 Dulany Street

Alexandria, VA.

John Pezzlo

12 January 2005



**JOHN PEZZLO
PRIMARY EXAMINER**